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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,685	07/15/2003	Hirohiko Hirochika	YAMZ 2 00005-2	8565

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EXAMINER	/
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KUBELIK, ANNE R

ART UNIT	PAPER NUMBER
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1638

DATE MAILED: 09/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/619,685

Applicant(s)

HIROCHIKA ET AL.

Examiner

Anne R. Kubelik

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 15 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 09/667,475.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Claims 1-6 are pending.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. The objection to claim 2 because of the recitation "The A" at the start of the claim is withdrawn in light of Applicant's amendment of the claim.

### ***Claim Objections***

4. Claims 2 and 4-6 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The rejection is repeated for the reasons of record as set forth in the Office action mailed 9 May 2005, as applied to claims 2 and 4. Applicant's arguments filed 15 July 2005 have been fully considered but they are not persuasive.

Claim 1 is drawn to a nucleic acid encoding SEQ ID NO:2, wherein SEQ ID NO:2 controls leaf shapes; dependent claim 2, recites that the nucleic acid controls leaf shapes in a specific manner. Claims 2 and 5-6 fail to further limit claim 1 because a protein of SEQ ID NO:2 would inherently alter leaf shapes in that manner. Claim 4 similarly fails to further limit claim 3.

Applicant urges that claims have been amended to recite that they reduce leaf length and leaf width; a protein would not control leaf shape in this manner (response pg 7).

This is not found persuasive. Claims 2 and 5-6 would only limit properly claim 1 if some

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nucleic acids encoding SEQ ID NO:2 reduce leaf length and/or leaf width and others do not.

Claim 4 would only limit properly claim 3 if some nucleic acids of SEQ ID NO:1 reduce leaf length and leaf width and others do not.

*Claim Rejections - 35 USC § 112*

5. Claims 1-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter that was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The rejection is repeated for the reasons of record as set forth in the Office action mailed 9 May 2005, as applied to claims 1-4. Applicant's arguments filed 15 July 2005 have been fully considered but they are not persuasive.

The claims are broadly drawn to nucleic acids of SEQ ID NO:1 or that encode SEQ ID NO:2.

The instant specification only provides guidance for activation of the Tos17 retrotransposon in rice plants comprising that transposon (example 1), isolation of narrow-leaf mutants (example 2), linkage analysis to show that Tos17 was linked to the narrow-leaf mutation (example 3), isolation of the gene (SEQ ID NO:3) responsible for the narrow-leaf mutation by TAIL-PCR of Tos17 (example 3 and 4), and construction of a cDNA library and isolation of a cDNA (SEQ ID NO:1, which encodes SEQ ID NO:2) corresponding to the gene (example 4).

The instant specification fails to provide guidance for how to use nucleic acids of SEQ ID NO:1 or that encode SEQ ID NO:2.

Plants in which genes that control leaf shape are altered by mutation or genetic

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engineering have unpredictable phenotypes. Schneeberger et al (1998, Development 125:2857-2865) show that maize plants in which the *rough sheath2* gene is disrupted by a transposon had leaf blade tissue transformed into sheath tissue and suggest that auxin homeostasis is disrupted in *rs2* mutants and in plants in which other homeodomain proteins are ectopically expressed (see pg 2860, right column, paragraph 2, and pg 2864, left column, paragraph 2). Hareven et al (1996, Cell 84:735-744) teach that ectopic expression of the *Knotted-1* gene affects simple and compound leaves in very different ways (pg 741, right column, paragraph 3, to pg 742, left column, paragraph 2). The instant specification suggests expressing SEQ ID NO:1 in a plant (see, e.g., pg 5, lines 16-17), but does not teach the effect overexpression would have on plants with different leaf structures; thus, one would not know how to use the invention.

The specification does not describe the transformation of any plant with a nucleic acid of SEQ ID NO:1 or that encodes SEQ ID NO:2, undue trial and error experimentation would be required to determine what, if any, effect this overexpression would have, and then determine how to use such plants.

Given the claim breadth, unpredictability in the art, and lack of guidance in the specification as discussed above, the instant invention is not enabled throughout the full scope of the claims.

Applicant urges that it was common knowledge at the time of filing how to use an aberrant nucleic acid to control leaf shape, such as through transposons or vectors to disrupt the gene, citing Miyao et al (response pg 8).

This is not found persuasive because the specification does not teach how to use the nucleic acid to control leaf shape. Miyao et al could not be considered, because it was not sent,

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but it is noted that references published after the filing date of an application may not be relied upon for the enablement of the specification (*In re Glass*, 181 USPQ 31, 34 (CCPA 1974)).

Applicant urges that the specification states that there is a gene in *Arabidopsis* that produces a protein with high homology to SEQ ID NO:1 and that rice proteins have homologs in other plants (response pg 8).

This is not found persuasive because none of that teaches how to use nucleic acids encoding SEQ ID NO:2.

Applicant urges that Schneeberger and Hareven show how to use the claimed nucleic acids; Schneeberger teaches what happens when *rough sheath2* is disrupted in maize and Hareven teaches that all simple leaves are determined by the same developmental program (response pg 9).

This is not found persuasive because neither Schneeberger nor Hareven are drawn to nucleic acids encoding SEQ ID NO:2, and thus do not teach how to use such a nucleic acid. Schneeberger and Hareven do show that the effects of overexpression of a gene encoding a protein controlling leaf shape must be determined empirically.

Applicant urges that the effects of changing leaf shape with the knotted-1 or rough sheath2 genes cannot be extrapolated to predict the effects, if any, of using the claimed nucleic acids, as Harevan points out that Knotted-1 has different effects in different plants; neither teaches a nucleic acid encoding SEQ ID NO:2 (response pg 9).

This is not found persuasive. This is why a working example of overexpression of a nucleic acid encoding SEQ ID NO:2 is required; there may be no effects of overexpression of such a nucleic acid, the effects may be different in different plants, or the effects may be

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different from anything predicted.

Applicant urges that the claim breath is supported by the common knowledge of one skilled in the art, and they have shown that in rice, a plant meeting all the claim limitations, use of the claimed nucleic acid results in a changed leaf shape; one of skill in the art would know how to use the claimed nucleic acid, and guidance is provided by use of the nucleic acid in rice (response pg 9-10).

This is not found persuasive. First, none of the claims are drawn to plants; thus, no plants meet all the claim limitations. Second, in no method in the specification, did Applicant use the claimed nucleic acid; what was used was the transposon in making the mutants. Thus, the specification does not teach how to use nucleic acids encoding SEQ ID NO:2.

Applicant urges that the written description guidelines do not require a description of transformation; there is not requirement that the specification describe transformation of every plant within the claim breadth (response pg 10).

This is not found persuasive because this is an enablement rejection, not a written description rejection. The specification does not describe the transformation of ANY plant with a nucleic acid encoding SEQ ID NO:2; thus, there are no working examples to overcome the enablement rejection.

6. Claims 1-6 are free of the prior art, given the failure of the prior art to teach or suggest an isolated nucleic acid encoding SEQ ID NO:2. The closest prior art is a nucleic acid encoding a protein with 45.1% identity to SEQ ID NO:2 (Choisne et al, 2000, GenBank Accession No. T47895; see search results).

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### *Conclusion*

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne R. Kubelik, whose telephone number is (571) 272-0801. The examiner can normally be reached Monday through Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones, can be reached at (571) 272-0745.

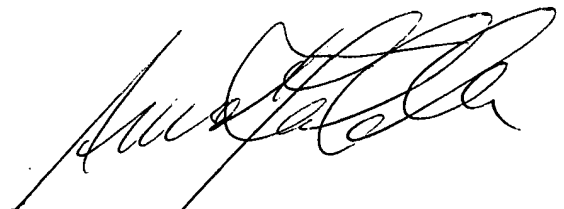
The central fax number for official correspondence is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

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For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

Anne R. Kubelik, Ph.D.  
September 20, 2005



**ANNE KUBELIK, PH.D.  
PRIMARY EXAMINER**